Enterprise JavaBeans Developer Workshop Trip Report

June 7 – 11, 1999
Seattle, Washington

Attended by Ly Sauer

The course was designed to provide a better understanding and enhance the JavaBeans development skills. A summary of the course is provided below.

Monday was spent on the introduction to Enterprise JavaBeans. Topics included an overview of the EJB architecture, its various contracts, and its requirements for developing EJB.

Tuesday was devoted to learning how to develop session beans. After the lecture, which concluded around 11:00am, the rest of the day was spent setting the development machine, installing/configuring the software, and developing beans & applications utilizing the beans. The applications were a version of the Hello World and a Simple Shopping Cart. The lab exercises used IBM VisaulAge for development, a modified EJBHome as the EJB Server, and Sybase for repository.

Wednesday was spent on EJB transaction service. Since EJB transaction service is based on CORBA OTS, the session started with CORBA OTS and proceeds to JTS and how it is different then OTS. Next the instructor covered how to write the various kinds of transaction services. The day concluded with an exercise in Transaction Service.

Thursday was allocated to Entity Beans. In particular, the lecture covered an introduction to entity bean and how to write the various entity beans. The day ended with an exercise in writing the shopping cart program using entity bean with data stored in the Sybase Database.

Friday was reserved for summarizing the weeks activities, a comparison of the differences among EJB Specification 1.0, 1.1, and J2EE. The instructor also provided a description of the various features that will be coming in J2EE (i.e. JMS, RMI over IIOP, etc).

Below are answers to the Software Integration Framework team's questions:

Q: Does EJB support polymorphic functions? method overload? Method override?
A: Since EJB beans are Java objects, EJB supports polymorphism the same as Java (method overload and method override).

Q: Is there a level of EJB compliance? What are the various compliance levels?
A: With EJB Specification 1.0, there is not any level of compliance among the various EJB Servers produced by the various vendors. Starting with EJB Specification 1.1, Sun will tighten the interfaces and provide a mechanism for the various vendors to determine compliance levels.

Q: Does EJB container support containment?
A: EJB container is just a collection of objects that provides the services as specified by the EJB container specification. Thus, EJB container does support containment. However, why would we want this function?

Q: Assessment of EJB vs CORBA Components?
A: EJB and CORBA components are complementary of each other. Sun and OMG's vision is to have them interoperate, where EJB beans are used by the application clients and CORBA components are used by the application servers. Thus, CORC is a super component of EJB.

Q: Evaluation of existing EJB products
A: After the dust settled, the instructor believes the survivors are NetDynamics, Weblogics, Inprise, ObixHome, and Oracle. Each of these products serves a different sector of the market.

I have hard copies of the lectures and exercise descriptions. I also have all of the exercises, IBM VisualAge, Sybase, and EJBHome on a CD.

I have appended the course syllabus for those of you who want to have a more detailed outline of the workshop and what was included.

Course Syllabus

Monday **Introduction to Enterprise JavaBeans**

- Introducing Enterprise JavaBeans
  - Defining Enterprise JavaBeans
  - Server Component Framework
  - Simplified Access to Services
  - Portability Across Servers
  - Separating Development Tasks
  - JavaBeans vs Enterprise JavaBeans
  - Developer Roles
- EJB Technology Architecture
  - Key Components in EJB
  - EJB Architecture Overview
  - EJB Server
  - EJB Container
  - EJBObject
  - Enterprise Bean
  - Session Beans
  - Entity Beans
  - Deployment Descriptor
  - EJB Jar File
  - Object Location with JNDI
- Session and Entity Beans
  - Comparing Session and Entity Beans
  - Creating a Bean
  - Invoking a Business Method
  - Passing and Returning Objects
  - Removing a Bean
  - Using a Handle
  - Using a Primary Key
  - Stubs and Skeletons
  - Exceptions
- Writing and Deploying EJBs
  - Writing the EJB
  - Writing the Home Interface
  - Writing the Remote Interface
  - Creating the Deployment Descriptor
  - Building the EJB Jar File
  - Modifying the Deployment Descriptor
  - Generating Container and EJBObject
  - Generating Stubs and Skeletons
  - Installing EJB into the Server

Tuesday **Writing a Simple EJB Application**

- Writing a Session Bean
  - SessionBean Interface
  - EJBContext Interface
  - SessionContext Interface
  - Accessing Your Environment
  - Defining ejbCreate
  - Session Bean State Type
  - Swapping Session Beans
  - ejbActivate & ejbPassivate
  - Use Transient Fields
  - Defining ejbRemove
- Exercise 1 – Getting Started
- Exercise 2 – Testing the Sample Beans
- Exercise 3 – Writing the Hello Bean
- Defining the Interfaces
  - javax.ejb.EJBHome
  - EJBMetaData
  - Writing Your Home Interface
  - javax.ejb.EJBObject
  - Writing Your Remote Interface
- Exercise 4 – Hello Interfaces
- Writing the EJB Client
  - The Server Namespace
  - Using JNDI InitialContext
  - Getting the Home Object
  - Creating a Bean Instance
  - Invoking Business Methods
  - Removing the Bean Instance
- Exercise 5 – Hello Client
- Exercise 6 – Simple Shopping Cart

Wednesday **Transactions**

- CORBA OTS 1.1
  - Transactions
  - OTS – Object Transaction Service
  - OTS Architecture
  - Transactional Object Roles
  - Distributed Transactions
  - EJB Requirements
- JTS – Java Transaction Service
  - Java Transaction Service
  - javax.jts Package
  - javax.jts.UserTransaction
- Using Transactions in a Bean
  - EJB Transaction Support
  - EJB Transaction Interface
  - EJB Transaction Architecture
  - Client-Controlled Transactions
  - Transaction Controls
- Bean-Managed Transactions
  - Bean-Managed Transactions
  - Transaction Specification Requirements
  - SessionSynchronziation Interface
  - Using Synchronization Callbacks
- Exercise 7 – Testing the Interfaces

Thursday **Entity Beans**

- Introduction to Entity Beans
  - Purpose Entity Beans
  - Persistence Implementations
  - EntityBean Interface
  - EntityContext Interface
  - Loading and Storing
  - The Primary Key
  - Primary Key Finder Method
- Bean-Managed Persistence
  - Benefits
  - Defining ejbCreate
  - Defining ejbRemove
  - Defining ejbLoad
  - Defining ejbStore
  - Defining ejbFindByPrimaryKey
- Exercise 8 – Setting Up Access to the Database
- Exercise 9 – Running the BuildCatalog Client
- Exercise 10 – Writing the Entity Beans
- Exercise 11 – Writing the Entity Bean Clients
- Defining Finder Methods
  - Creating Finders
  - Singleton Finders
  - Multiple Row Finders
  - Declaring Finders in the Home
- Exercise 12 – Defining the Finder Methods
- Exercise 13 – Using Finders in the Client
- Container-Managed Persistence
  - Container-Managed Persistence
  - Defining ejbCreate
  - Defining ejbRemove
  - Defining ejbLoad
  - Defining ejbStore
  - Finder Methods
- Exercise 14 – Implementing Container-Managed Persistence
- Calling Entity Beans From Session Beans
  - Multiple Calls in One Transaction
  - Business Rules
- Exercise 15 - The Full Cart
- Exercise 16 – Extra Credits!!!!
- Container Policies for Providing Synchronization
  - EntityBean Identity
  - Single EJB Instance Per Identity
  - Multiple EJBs Per Identity
  - Maintaining No EJB Instances

Friday Summary of Lessons Learned and Overview of EJB 1.1 and J2EE